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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/523,027

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Weiping Zeng

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7590 03/27/2008
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EXAMINER

PEPITONE, MICHAEL F

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1796

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/523,027	Applicant(s) ZENG ET AL.	
	Examiner MICHAEL PEPITONE	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto *et al.* (US Patent 6,037,388) in view of Rhienberger *et al.* (US Patent 6,353,039), when taken with Ohno *et al.* (US 5,171,763).

Regarding claims 1-2, 4-6, and 10-13: Hashimoto *et al.* teaches a dental adhesive composition (1:14-20) comprising polymerizable methacrylate monomers in 30-90 weight% (mono and/or polyfunctional, with polyfunctional monomers based on methacrylic acid esters of a polyhydric alcohols) (4:17-24; 4:36-60; 5:1-15); polymerizable monomers having a carboxylic acid group in 2-20% (9:28-47; 9:54-57); an organoboron compound in 1-30 weight% (2:23-49);

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and filler in an amount of 0-60 wt% [instant claim 2] (9:58-10:24; 10:35-38; 12:23-29; 13:32-40); wherein the total of components is 100% (4:17-24; 13:34-40).

Hashimoto *et al.* does not teach polyfunctional monomers based on esters that contain 1-2 hydroxyl groups in an amount of 1-30 wt% [instant claim 1]. However, Rhienberger *et al.* teaches a dental composition comprising dilution monomers (based on methacrylic acid esters), which contain at least 2 polymerizable groups and 1-2 hydroxyl groups (5:29-51), specifically glycerol dimethacrylate (5:41-42), in an amount of at least 5% (6:1-9) [instant claims 1, 4-6, and 10-13]. Hashimoto *et al.* and Rhienberger *et al.* are combinable because they are concerned with a similar technical difficulty, namely the preparation of dental materials. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined dilution monomers, as taught by Rhienberger *et al.* in the invention of Hashimoto *et al.*, and would have been motivated to do so since Rhienberger *et al.* suggests that dilution monomers provide composites with high filler contents (5:30-33), and is an equivalent alternative means of providing a polymerizable composition for dental applications.

Ohno *et al.* (US 5,171,763) provides evidence of dental materials (1:5-15) comprising acid containing monomers (2:20-39), ion-leachable fillers (2:39-41, 10:11-60), and polyfunctional polymerizable compounds having –OH groups {pentaerythritol trimethacrylate} (9:5-10).

Regarding claim 3: Hashimoto *et al.* teaches solvent in 10-150 parts by weight, based on 100 parts organoboron compound, specifically 0.1-45 wt% (2:16-21; 2:55-3:10; m4:17-25).

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Regarding claims 7 and 14: Hashimoto *et al.* teaches the acid group containing polymerizable monomer is 4-methacryloyloxyethyltrimellitic acid and 4-methacryloyloxyethyltrimellitic anhydride [instant claim 7 and 14] (9:36-37).

Regarding claims 8 and 15: Hashimoto *et al.* teaches the organoboron compound is tributylborane and/or partially oxidized tributylborane [instant claims 8 and 15] (2:45-50; 11:38-12:5).

Regarding claim 9: Hashimoto *et al.* teaches the filler is polymethylmethacrylate particles (11:34-36).

Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto *et al.* (US Patent 6,037,388) in view of Rhienberger *et al.* (US Patent 6,353,039), when taken with Ohno *et al.* (US 5,171,763).

Regarding claims 16-17, and 19: Hashimoto *et al.* teaches a dental adhesive composition (1:14-20) comprising polymerizable methacrylate monomers in 30-90 weight% (mono and/or polyfunctional, with polyfunctional monomers based on methacrylic acid esters of a polyhydric alcohols), specifically methyl methacrylate (4:17-24; 4:36-60; 5:1-15); polymerizable monomers having a carboxylic acid group in 2-20% (9:28-47; 9:54-57); an organoboron compound in 1-30 weight% (2:23-49); and filler in an amount of 0-60 wt% [instant claim 17] (9:58-10:24; 10:35-38; 12:23-29; 13:32-40); wherein the total of components is 100% (4:17-24; 13:34-40).

Hashimoto *et al.* does not teach polyfunctional monomers based on esters that contain 1-2 hydroxyl groups in an amount of 1-30 wt% [instant claim 16]. However, Rhienberger *et al.* teaches a dental composition comprising dilution monomers (based on methacrylic acid esters),

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which contain at least 2 polymerizable groups and 1-2 hydroxyl groups (5:29-51), specifically glycerol dimethacrylate (5:41-42), in an amount of at least 5% (6:1-9) [instant claims 16 and 19]. Hashimoto *et al.* and Rhienberger *et al.* are combinable because they are concerned with a similar technical difficulty, namely the preparation of dental materials. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined dilution monomers, as taught by Rhienberger *et al.* in the invention of Hashimoto *et al.*, and would have been motivated to do so since Rhienberger *et al.* suggests that dilution monomers provide composites with high filler contents (5:30-33), and is an equivalent alternative means of providing a polymerizable composition for dental applications.

Ohno *et al.* (US 5,171,763) provides evidence of dental materials (1:5-15) comprising acid containing monomers (2:20-39), ion-leachable fillers (2:39-41, 10:11-60), and polyfunctional polymerizable compounds having –OH groups {pentaerythritol trimethacrylate} (9:5-10).

Regarding claim 18: Hashimoto *et al.* teaches solvent in 10-150 parts by weight, based on 100 parts organoboron compound, specifically 0.1-45 wt% (2:16-21; 2:55-3:10; m4:17-25).

Regarding claim 20: Hashimoto *et al.* teaches the acid group containing polymerizable monomer is 4-methacryloyloxyethyltrimellitic acid and 4-methacryloyloxyethyltrimellitic anhydride (9:36-37).

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. See attached form PTO-892.

Response to Arguments

Applicant's arguments filed 12/10/07 have been fully considered but they are not persuasive. The rejection of claims 1-15 based on Hashimoto *et al.* (US Patent 6,037,388) in view of Rhienberger *et al.* (US Patent 6,353,039) is maintained for reason of record and following response.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Hashimoto *et al.* (US '388) teaches a dental adhesive comprising polyfunctional (meth)acrylates and fillers, but does not teach the polyfunctional polymerizable monomers of the instant application. However, Rhienberger *et al.* (US '039) discloses dental adhesives comprising polyfunctional polymerizable monomers (glycerol dimethacrylate) as reactive diluents, thereby allowing high filler contents as well as a means of adjusting the viscosity of the resin. Hashimoto *et al.* and Rhienberger *et al.* are combinable because they are concerned with a similar technical difficulty, namely the preparation of dental materials.

The prior art, Ohno *et al.* (US 5,171,763), discloses dental materials (1:5-15) comprising acid containing monomers (2:20-39), polyfunctional polymerizable compounds having –OH groups {pentaerythritol trimethacrylate} (9:5-10), and ion-leachable fillers (2:39-41, 10:11-60). A person having ordinary skill in the art would indeed rely on the teachings of Rheinberger *et al.*

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for reactive diluents (glycerol dimethacrylate) {viscosity modifiers}, because the prior art clearly discloses dental adhesive compositions comprising acid containing monomers and ion leachable fillers {compomers, glass ionomer cements}. Regardless, Hashimoto *et al.* (US '388) is not concerned with dental adhesives comprising ion-leachable glasses.

In response to applicant's argument that the polyfunctional polymerizable monomer has the effect of significantly enhancing the curing rate of the resulting adhesive without adversely affecting the adhesion properties, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Pepitone whose telephone number is 571-270-3299. The examiner can normally be reached on M-F, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MFP
19-March-08

/David Wu/
Supervisory Patent Examiner, Art Unit 1796